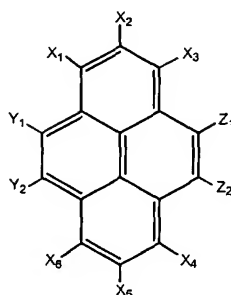


CLAIMS

1. A pyrene based compound according to the following formula:



wherein Z₁ represents a hydrogen atom, deuterium atom, oxygen atom, silicon atom, selenium atom, substituted or unsubstituted aryl group, substituted or unsubstituted heteroaryl group, substituted or unsubstituted aryl amine or a combination thereof, and Z₂ represents a hydrogen or deuterium atom;

wherein one of Y₁ and Y₂ represents a hydrogen atom, deuterium atom, oxygen atom, silicon atom, selenium atom, a substituted or unsubstituted aryl group, substituted or unsubstituted heteroaryl group, substituted or unsubstituted aryl amine or a combination thereof, and the other of Y₁ and Y₂ represents a hydrogen or deuterium atom;

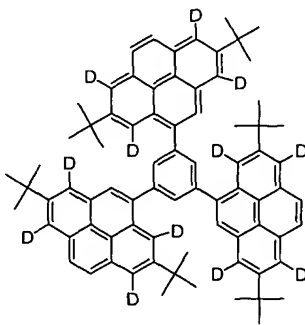
wherein X₁ through X₆ independently represent hydrogen atoms, deuterium atoms, alkyl groups or aryl groups, and at least one of X₁ through X₆ represents a bulky alkyl group or bulky aryl group; and

wherein at least one of X₁ through X₆, Y₁, Y₂, Z₁, and Z₂ represents a deuterium atom.

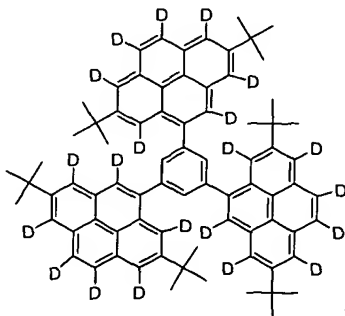
2. The compound of Claim 1, wherein Z₁, Y₁ and Y₂ independently represent a hole injection chromophore, an electron injection chromophore, or both.

3. The compound of Claim 1, wherein Z₁, Y₁ and Y₂ independently represent a cross-linking group.

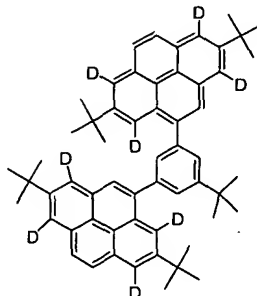
4. The compound of Claim 3, wherein the cross-linking group comprises a di-vinyl group.
5. The compound of Claim 1, wherein Z_1 , Y_1 and Y_2 independently represent a benzene ring substituted with one or two pyrenyl groups.
6. The compound of Claim 1, wherein X_1 through X_6 independently represent a tert-butyl group or a triphenyl silane.
7. The compound of Claim 1, wherein X_2 and X_5 represent the same bulky alkyl group or bulky aryl group.
8. The compound of Claim 1, wherein the compound has the following structure:



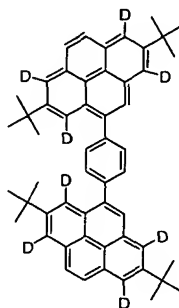
9. The compound of Claim 1, wherein the compound has the following structure:



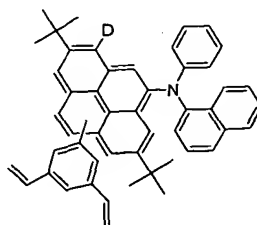
10. The compound of Claim 1, wherein the compound has the following structure:



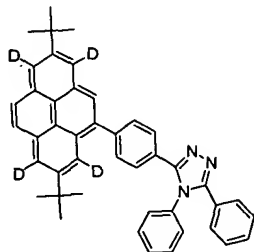
11. The compound of Claim 1, wherein the compound has the following structure:



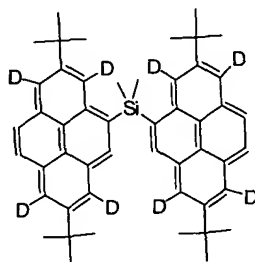
12. The compound of Claim 1, wherein the compound has the following structure.



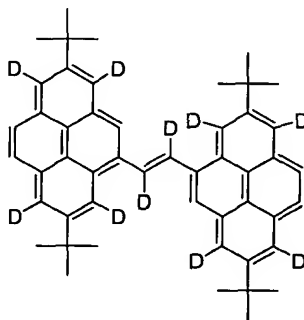
13. The compound of Claim 1, wherein the compound has the following structure:



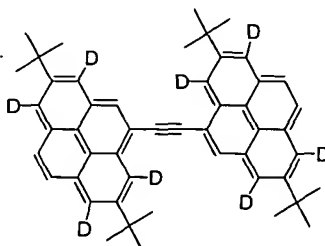
14. The compound of Claim 1, wherein the compound has the following structure:



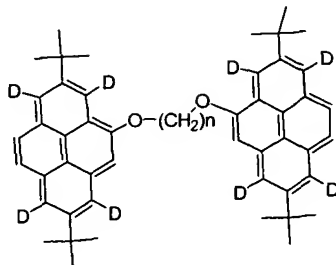
15. The compound of Claim 1, wherein the compound has the following structure:



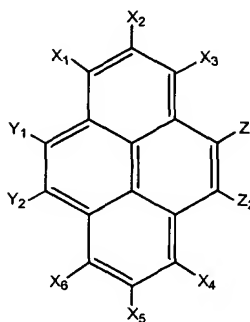
16. The compound of Claim 1, wherein the compound has the following structure:



17. The compound of Claim 1, wherein the compound has the following structure:



18. An organic light emitting device comprising an anode, a cathode and at least one organic layer sandwiched between the anode and the cathode, wherein the organic layer comprises a pyrene based compound of the following general formula:



wherein Z_1 represents a hydrogen atom, deuterium atom, oxygen atom, silicon atom, selenium atom, substituted or unsubstituted aryl group, substituted or unsubstituted heteroaryl group, substituted or unsubstituted aryl amine or a combination thereof, and Z_2 represents a hydrogen or deuterium atom;

wherein one of Y_1 and Y_2 represents a hydrogen atom, deuterium atom, oxygen atom, silicon atom, selenium atom, a substituted or unsubstituted aryl group, substituted or unsubstituted heteroaryl group, substituted or unsubstituted aryl amine or a combination thereof, and the other of Y_1 and Y_2 represents a hydrogen or deuterium atom;

wherein X_1 through X_6 independently represent hydrogen atoms, deuterium atoms, alkyl groups or aryl groups, and at least one of X_1 through X_6 represents a bulky alkyl group or bulky aryl group; and

wherein at least one of X_1 through X_6 , Y_1 , Y_2 , Z_1 , and Z_2 represents a deuterium atom.

19. The organic light emitting device of Claim 18, wherein the organic layer is an emissive layer, a hole transport layer, an electron transport layer or combinations thereof.

20. The organic light emitting device of Claim 18, wherein the pyrene based compound serves as a host material of said organic layer.

21. The organic light emitting device of Claim 18, wherein the pyrene based compound serves as a dopant of said organic layer.

22. The organic light emitting device of Claim 18, wherein Z_1 , Y_1 and Y_2 independently represent a hole injection chromophore, an electron injection chromophore, or both.

23. The organic light emitting device of Claim 18, wherein Z_1 , Y_1 and Y_2 independently represent a cross-linking group.

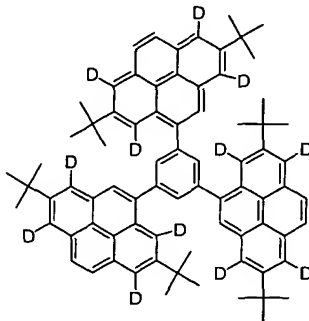
24. The organic light emitting device of Claim 23, wherein the cross-linking group comprises a di-vinyl group.

25. The organic light emitting device of Claim 18, wherein Z_1 , Y_1 and Y_2 independently represent a benzene ring substituted with one or two pyrenyl groups.

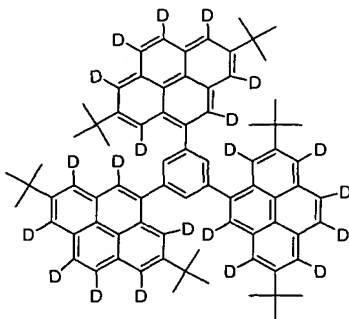
26. The organic light emitting device of Claim 18, wherein X_1 through X_6 independently represent a tert-butyl group or a triphenyl silane.

27. The organic light emitting device of Claim 18, wherein X_2 and X_5 represent the same bulky alkyl group or bulky aryl group.

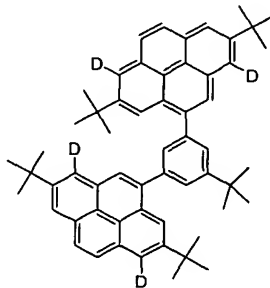
28. The organic light emitting device of Claim 18, wherein the pyrene based compound has the following structure:



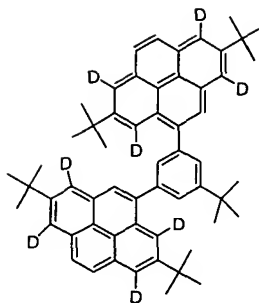
29. The organic light emitting device of Claim 18, wherein the compound has the following structure:



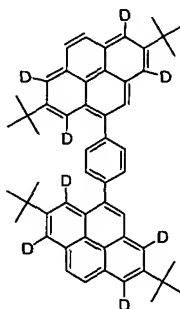
30. The organic light emitting device of Claim 18, wherein the pyrene based compound has the following structure:



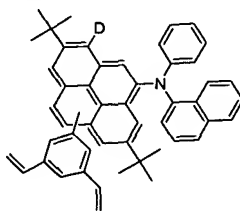
31. The organic light emitting device of Claim 18, wherein the pyrene based compound has the following structure:



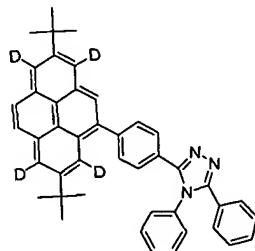
32. The organic light emitting device of Claim 18, wherein the pyrene based compound has the following structure:



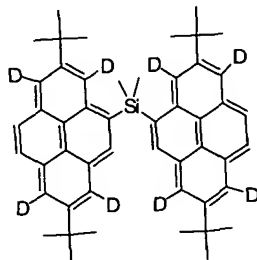
33. The organic light emitting device of Claim 18, wherein the pyrene based compound has the following structure:



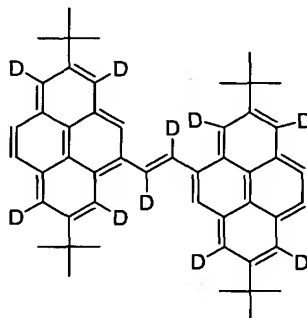
34. The organic light emitting device of Claim 18, wherein the pyrene based compound has the following structure:



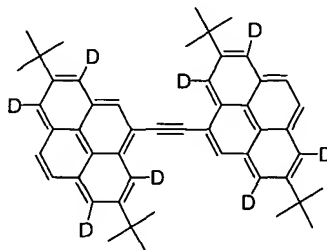
35. The organic light emitting device of Claim 18, wherein the pyrene based compound has the following structure:



36. The organic light emitting device of Claim 18, wherein the pyrene based compound has the following structure:



37. The organic light emitting device of Claim 18, wherein the pyrene based compound has the following structure:



38. The organic light emitting device of Claim 18, wherein the pyrene based compound has the following structure:

